

We claim:

- 1    1.      A method for protecting a material from ant infestation, comprising treating the material with  
2    an effective amount of a compound selected from the group consisting of nootkatone,  $\alpha$ -cedrene,  
3    zizanol, and bicyclovetivenol, wherein the treated material repels or kills ants substantially more  
4    than does an otherwise identical material that has not been treated with the compound.
  
- 1    2.      A method as in Claim 1, wherein the ants are fire ants.
  
- 1    3.      A method as in Claim 1, wherein the treated material repels ants.
  
- 1    4.      A method as in Claim 1, wherein the treated material kills ants.
  
- 1    5.      A method as in Claim 1, wherein the material is selected from the group consisting of soil,  
2    synthetic polymers, diatomaceous earth, sand, and cellulose-containing materials.
  
- 1    6.      A method as in Claim 1, wherein the compound is nootkatone.

- 1    7.      A method as in Claim 1, wherein the compound is  $\alpha$ -cedrene.
- 1    8.      A method as in Claim 1, wherein the compound is zizanol.
- 1    9.      A method as in Claim 1, wherein the compound is bicyclovetivenol.
- 1    10.     A method as in Claim 1, additionally comprising treating the material with one or more  
2    additional, different compounds selected from the group consisting of nootkatone,  $\alpha$ -cedrene,  
3    zizanol, and bicyclovetivenol.
- 1    11.     A protective barrier against ant infestation, said barrier comprising an effective amount of  
2    a compound selected from the group consisting of nootkatone,  $\alpha$ -cedrene, zizanol, and  
3    bicyclovetivenol, and a substrate, wherein said barrier repels or kills ants substantially more than  
4    does an otherwise identical barrier that has not been treated with said compound.
- 1    12.     A composition as in Claim 11, wherein the ants are fire ants.

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- 1    **13.**    A composition as in Claim 11, wherein said substrate comprises a mulch.
- 1    **14.**    A composition as in Claim 13, wherein said mulch comprises dried vetiver grass.
- 1    **15.**    A composition as in Claim 13, wherein said mulch comprises cellulose-containing material.
- 1    **16.**    A composition as in Claim 11, wherein said substrate comprises soil.
- 1    **17.**    A composition as in Claim 11, wherein said substrate comprises diatomaceous earth.
- 1    **18.**    A composition as in Claim 11, wherein said compound is nootkatone.

1   **19.**    A composition as in Claim 18, wherein the concentration of nootkatone in said barrier is  
2   between about 10 µg/g and about 1000 µg/g.

1   **20.**    A composition as in Claim 18, wherein the concentration of nootkatone in said barrier is  
2   between about 10 µg/g and about 200 µg/g.

1   **21.**    A composition as in Claim 11, wherein said compound is zizanol.

1   **22.**    A composition as in Claim 11, wherein said compound is bicyclovetivenol.

1   **23.**    A composition as in Claim 11, wherein said compound is  $\alpha$ -cedrene.

1   **24.**    A composition as in Claim 11, additionally comprising treating said substrate with a one or  
2   more additional, different compounds selected from the group consisting of nootkatone,  $\alpha$ -cedrene,  
3   zizanol and bicyclovetivenol.

1   **25.**    A method for protecting a material from tick infestation, comprising treating the material  
2   with an effective amount of a compound selected from the group consisting of nootkatone,  $\alpha$ -  
3   cedrene, zizanol, and bicyclovetivenol, wherein the treated material repels or kills ticks substantially  
4   more than does an otherwise identical material that has not been treated with the compound.

1   **26.**    A method as in Claim 25, wherein the treated material repels ticks.

1   **27.**    A method as in Claim 25, wherein the treated material kills ticks.

1   **28.**    A method as in Claim 25, wherein the material is selected from a group consisting of soil,  
2   synthetic polymers, diatomaceous earth, sand, and cellulose-containing materials.

1   **29.**    A method as in Claim 25, wherein the compound is nootkatone.

1   **30.**    A method as in Claim 25, wherein the compound is  $\alpha$ -cedrene.

1    **31.**    A method as in Claim 25, wherein the compound is zizanol.

1    **32.**    A method as in Claim 25, wherein the compound is bicyclovetivenol.

1    **33.**    A method as in Claim 25, additionally comprising treating the material with one or more  
2 additional, different compounds selected from the group consisting of nootkatone,  $\alpha$ -cedrene,  
3 zizanol, and bicyclovetivenol.

1    **34.**    A protective barrier against tick infestation, said barrier comprising an effective amount of  
2 a compound selected from the group consisting of nootkatone,  $\alpha$ -cedrene, zizanol, and  
3 bicyclovetivenol, and a substrate, wherein said barrier repels or kills ticks substantially more than  
4 does an otherwise identical barrier that has not been treated with said compound.

1    **35.**    A composition as in Claim 34, wherein said substrate comprises a mulch.

- 1    **36.**    A composition as in Claim 35, wherein said mulch comprises dried vetiver grass.
- 1    **37.**    A composition as in Claim 35, wherein said mulch comprises cellulose-containing material.
- 1    **38.**    A composition as in Claim 34, wherein said substrate comprises soil.
- 1    **39.**    A composition as in Claim 34, wherein said substrate comprises diatomaceous earth.
- 1    **40.**    A composition as in Claim 34, wherein said compound is nootkatone.
- 1    **41.**    A composition as in Claim 40, wherein the concentration of nootkatone in said barrier is  
2    between about 10 µg/g and about 1000 µg/g.

1    **42.**    A composition as in Claim 40, wherein the concentration of nootkatone in said barrier is  
2    between about 10 µg/g and about 200 µg/g.

1    **43.**    A composition as in Claim 34, wherein said compound is zizanol.

1    **44.**    A composition as in Claim 34, wherein said compound is bicyclovetivenol.

1    **45.**    A composition as in Claim 34, wherein said compound is α-cedrene.

1    **46.**    A composition as in Claim 34, additionally comprising treating the substrate material with  
2    a one or more additional, different compounds selected from the group consisting of nootkatone, α-  
3    cedrene, zizanol and bicyclovetivenol.

1    **47.**    A topical composition for application to the skin or fur of a mammal for protection against  
2    ticks, said composition comprising an effective amount of a compound selected from the group  
3    consisting of nootkatone, α-cedrene, zizanol, and bicyclovetivenol, and a pharmaceutically accepted  
4    carrier, wherein said composition when applied topically repels or kills ticks substantially more than  
5    does an otherwise identical composition that lacks the compound.



1    **48.**    A composition as in Claim 47, wherein said compound is nootkatone.

1    **49.**    A composition as in Claim 48, wherein the concentration of nootkatone in said composition  
2    is between about 10 µg/g and about 1000 µg/g.

1    **50.**    A composition as in Claim 48, wherein the concentration of nootkatone in said composition  
2    is between about 10 µg/g and about 200 µg/g.

1    **51.**    A composition as in Claim 47, wherein said compound is zizanol.

1    **52.**    A composition as in Claim 47, wherein said compound is bicyclovetivenol.

1    **53.**    A composition as in Claim 47, wherein said compound is  $\alpha$ -cedrene.

1   **54.**     A composition as in Claim 47, additionally comprising a composition with a one or more  
2   additional, different compounds selected from the group consisting of nootkatone,  $\alpha$ -cedrene, zizanol  
3   and bicyclovetivenol.

1   **55.**     A method for protecting a material from cockroach infestation, comprising treating the  
2   material with an effective amount of a compound selected from the group consisting of nootkatone,  
3    $\alpha$ -cedrene, zizanol, and bicyclovetivenol, wherein the treated material repels cockraches substantially  
4   more than does an otherwise identical material that has not been treated with the compound.

1   **56.**     A method as in Claim 55, wherein the material is selected from the group consisting of soil,  
2   synthetic polymers, diatomaceous earth, sand, and cellulose-containing materials.

1   **57.**     A method as in Claim 55, wherein the compound is nootkatone.

1   **58.**     A method as in Claim 55, wherein the compound is  $\alpha$ -cedrene.

1   **59.**     A method as in Claim 55, wherein the compound is zizanol.

- 1    **60.**    A method as in Claim 55, wherein the compound is bicyclovetivenol.
- 1    **61.**    A method as in Claim 55, additionally comprising treating the material with one or more  
2    additional, different compounds selected from the group consisting of nootkatone,  $\alpha$ -cedrene,  
3    zizanol, and bicyclovetivenol.
- 1    **62.**    A protective barrier against cockroach infestation, said barrier comprising an effective  
2    amount of a compound selected from the group consisting of nootkatone,  $\alpha$ -cedrene, zizanol, and  
3    bicyclovetivenol, and a substrate, wherein said barrier repels cockroaches substantially more than  
4    does an otherwise identical barrier that has not been treated with said compound.
- 1    **63.**    A composition as in Claim 62, wherein said substrate comprises a mulch.
- 1    **64.**    A composition as in Claim 63, wherein said mulch comprises dried vetiver grass.
- 1    **65.**    A composition as in Claim 63, wherein said mulch comprises cellulose-containing material.

- 1    **66.**    A composition as in Claim 62, wherein said substrate comprises soil.
- 1    **67.**    A composition as in Claim 62, wherein said substrate comprises diatomaceous earth.
- 1    **68.**    A composition as in Claim 62, wherein said compound is nootkatone.
- 1    **69.**    A composition as in Claim 68, wherein the concentration of nootkatone in said barrier is  
2    between about 10 µg/g and about 1000 µg/g.
- 1    **70.**    A composition as in Claim 68, wherein the concentration of nootkatone in said barrier is  
2    between about 10 µg/g and about 200 µg/g.
- 1    **71.**    A composition as in Claim 62, wherein said compound is zizanol.

1    **72.**    A composition as in Claim 62, wherein said compound is bicyclovetivenol.

1    **73.**    A composition as in Claim 62, wherein said compound is  $\alpha$ -cedrene.

1    **74.**    A composition as in Claim 62, additionally comprising treating the substrate material with  
2    a one or more additional, different compounds selected from the group consisting of nootkatone,  $\alpha$ -  
3    cedrene, zizanol and bicyclovetivenol.